

mation regarded, the result is not affected by the previous transformations, or by the substitution, t. ii. p. 800, introducing for α , e , γ , their standard elliptic values.

Notes on some Drawings of Mars, made during the recent Opposition. By John Browning, F.R.A.S.

The thirteen coloured drawings of *Mars* I have now the pleasure of exhibiting to the Society were made with Mr. Barnes' $8\frac{1}{2}$ -inch silvered-glass reflector. They represent the planet as it appeared on Dec. 29th, 1866, at 9^h 30^m G.M.T.; on Jan. 8th, 1867, at 9^h 1^m; Jan. 28th, at 9; on Jan. 28th, at 12.30; on Feb. 6th, at 8.15; on Feb. 6th, at 11.30; on Feb. 8th, at 8.30; on Feb. 8th, at 10.30; on Feb. 16th, at 6.45; on Feb. 23rd, at 8.45; on Feb. 23rd, at 10.30; and on Feb. 24th, at 1 A.M. Achromatic eye-pieces were used; generally the power was about 300, but occasionally I have used as high as 600.

I have shown these drawings to Mr. De La Rue, who had no trouble in matching two of them with his own two exquisite drawings of the planet. Mr. De La Rue's drawings which were taken by the aid of his 13-inch metal speculum of his own make, contain more detail than my own drawings, but Mr. De La Rue expressed his opinion that my drawings were valuable from the number I had succeeded in obtaining.

I have made nearly thirty sketches at the telescope, but I have copied only those that were made when the air was tolerably steady, and the definition so good that I could work well with high powers. When several sketches were made on the same evening, they were made at intervals of two hours, if the weather permitted. In only one instance have I failed to perceive that the form of the markings was permanent, due allowance being made for the effect of perspective in foreshortening them as they approached the edge of the disk.

It is highly probable that in the view of the planet taken on Feb. 16th, at 6.45, the two pointed markings on the extreme left, one above and the other below the equator, would have been seen united if they could have been observed when they were on the centre of the disk. This drawing would then have agreed pretty closely with one of Mr. Dawes' views engraved in the *Astronomical Register*, for Sept. 1865.

The colour of the body of *Mars* I have found vary from rose-madder to burnt-ochre, the colour appearing ruddiest when there was most mist in our atmosphere. The comparative absence of the ruddy colour towards the edges of the disk of the planet, Mr. Norman Lockyer has ascribed to the presence of clouds in the planet's own atmosphere.

Mr. Huggins, in his valuable paper on the "Spectrum and the Colour of *Mars*" (*Monthly Notices*, March 8, 1867), has referred the absence of colour at the edges of the planet, to some peculiar effect of the surface of the planet itself.

That the ochreish colour is due to some peculiarity in the surface is, I think, almost proved by Mr. De La Rue's drawings of *Mars*, as in these are seen markings of an ochreish colour with definite outlines.

The colour of the dark markings on *Mars* has been described as greenish or bluish-gray. They always appear bluish-gray to me, and this colour I have depicted them. Occasionally the North Polar ice has been shown tinted with the same colour.

I have examined the spectrum of the planet with a direct-vision spectroscope. The spectrum of the dark markings presented no distinctive peculiarity. This would scarcely prove the entire absence of a blue or green shade of colour in the markings, as I have found that if white light be reflected five or six times from surfaces of metallic silver, and then received on white paper, it will be strongly tinged with a chocolate colour. Yet if the light reflected from paper thus illuminated be examined by means of a spectroscope, no appreciable difference will be seen between the spectrum of this light and that of white light. In consequence of the effect of irradiation, I have not been able to make out satisfactorily the outline of the North Polar ice.

I have frequently seen faint white spots appear on the disk, and as these spots approached the edge of the disk they increased in brilliancy, until when nearly at the extreme edge of the disk, they almost rivalled the polar snows in whiteness. The white cloudy patches had never any definite outlines. They were generally nearly circular in form, and they always appeared in the region of the equator. One of these white cloudy spots I have shown in the sketch taken on Feb. 8th, at 10.30. The spot is represented passing off the left-hand edge of the disk.

Mr. De La Rue has shown the dark markings near the south pole as darkest towards the edge nearest to the centre of the planet, and just below the edge of the dark markings the ruddy colour of the body as much fainter than it is nearer to the equator.

I see these appearances distinctly.

In the drawing taken on Jan. 28th, at 9^h, a number of breaks will be seen in the edge of the dark marking near the south pole; these breaks forming a series of light streaks directed towards the pole. Mr. Barnes made a sketch at the telescope without seeing mine, and as with the exception of a slight difference in the angle given to these light streaks, the two sketches agreed, I cannot have been mistaken in their appearance having been as I have drawn and described them.

On the 31st of March, at 7 P.M., I obtained an exact repetition of the position shown in the sketch taken on Feb. 23rd, at 9 P.M.

In these two drawings the mark usually termed the hour-glass mark, is represented as having just passed the centre of the disk of the planet.

This would give a velocity of revolution to the planet agreeing within 44" with Beer and Madler's determination.

Mr. Barnes has made sketches corresponding with nearly all my drawings, and agreeing with them in all the general features.

It was also stated by him & Mr. Dawes that it has no sensible ellipticity, & Stone agrees

A *Determination of the Coefficient of the Parallaxic Inequality, and a Deduction of the Value of the Sun's Mean Horizontal Equatoreal Parallax from the Greenwich Lunar Observations 1848-1866.* By E. J. Stone, Esq. (Abstract.)

The longitudes deduced from the observations made near the maximum of the Parallaxic Inequality are compared with the tabular longitudes; and (it being assumed that the error in the mean results arises entirely from error in the coefficient of the parallaxic inequality) the comparison furnishes a correction to the coefficient in question, and consequently also to the value of the Solar Parallax used in the calculation of that coefficient. The result, as deduced from in all 2075 observations, is that the coefficient of the Parallaxic Inequality is $= 125''.36$; and that the corresponding value of the Solar Parallax is $= 8''.850$, with a possible error not greater than $\pm 0''.056$ in the parallax, arising from an assumed uncertainty $0''.4$ in the theoretic value of the coefficient of the inequality, and an assumed uncertainty of the same amount in the value of the coefficient as obtained from the Observations.

On the Mass of the Moon as deduced from the Mean Range of Spring and Neap Tides at Dover during the years 1861, 1864, 1865, and 1866. By H. P. Finlayson, Esq.

The determination is effected by means of the following equation:—

$$(19.192)^2 : (15' 43''.76)^3 + \frac{(16' 1''.82)^3}{x} :: (10.939)^2 : (15' 30'')^3 - \frac{(16' 1''.82)^3}{x}$$

viz. 19.192 feet is the mean range of the spring-tides for the